BBRI Broadband Rhode Island

An initiative of the RIEDC

Broadband Policy for Rhode Island

Achieving Competitive Advantage in the Internet Age

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community economic
FUTURES

BBRI Broadband Rhode Island

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Because of the digital revolution, Americans and citizens across the world are experiencing a transformation the likes of which we see only once in a lifetime. The Internet has increased our ability to communicate, conduct business, gain knowledge, transcend both time and space to make the world smaller and more accessible than ever before. We're using it in our homes, libraries, classrooms, doctors' offices, hospitals, automobiles, battlefields and café's -- over wire and through the air. And as sophisticated and fast moving as it seems, we are just tending the seedlings of a digital world and a digital economy.

Broadband, the infrastructure that enables us to access the Internet, is transforming every aspect of our lives. But according to federal research an amazing 30% of the US population does not use the Internet today for reasons ranging from economics to accessibility. Increasing broadband adoption and digital literacy is crucial to moving ahead in a digital economy. You can't have two-thirds of the population on-line and the rest left behind.

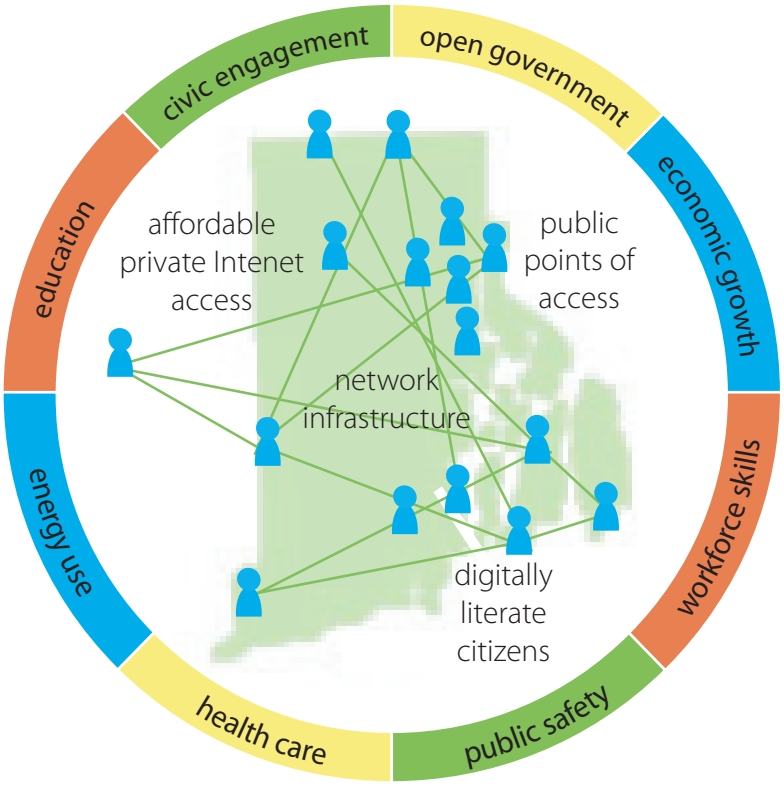
This report represents the culmination of a 6 month effort. Stakeholders from all sectors of the state were engaged in a process to identify and develop a set of priorities for the role of broadband in Rhode Island, keeping a particular eye towards the initiation of policy discussions. Ultimately, the big question was – What will the state's role be in all of this?

Nationwide, moving toward a digital economy is so important that 40 out of 50 states have some form of a broadband advisory board or authority established by executive order or legislation. Among the various recommendations we've developed, first, and maybe most important, is to develop a similar structure in Rhode Island—a high level statewide advisory board or commission that will provide advice and direction to the current administration as to where to focus its attention.

I'd like to thank the many people who were involved in the development and review of this report - their names are listed on the opposite page. Special thanks go to Robert Leaver of New Commons, who led the stakeholder process, Beth Ashman of Community Economic Futures who authored the report and Alisson Walsh who managed the entire report creation process.

I hope you'll join me and RIEDC in moving this important initiative ahead. I am certain we are on the right path.

Stuart Freiman
Director, Broadband Programs
Rhode Island Economic Development Corporation
January 2012


civic engagement
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digitally
literate
citizens

Broadband Policy for Rhode Island

Achieving Competitive Advantage in the Digital Age

EXECUTIVE SUMMARY

Broadband Matters to Rhode Islanders

Broadband, otherwise known as high-speed Internet, is the new, indispensable infrastructure for the flow of commerce, communication, government services, and information of all kinds. Because the Internet has become essential to full participation in public life, the U.S. is committed to achieving universal broadband access similar to the high levels of access achieved for electrification and telephone service.

State governments have a high-stakes role to play in educating digital citizens and using the Internet to make delivery of government services more efficient and cost effective. The Internet is a powerful unifying technology that can be used to address key public policy areas, including:

- Better government services within tight budgets
- Open government and civic engagement
- Economic and workforce development
- Effective and affordable healthcare delivery
- Quality education for every citizen
- Integrated public safety and disaster response

These public-sector benefits become achievable when virtually all citizens have the access AND the know-how to tap into the Internet.

The Good News

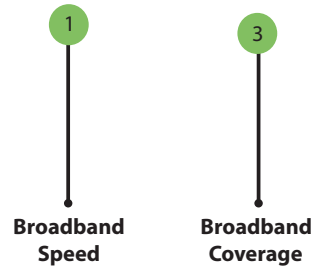
Rhode Island is ranked among the top three states in broadband speed and coverage. That means we have the technical infrastructure in place to connect just about every Rhode Islander to high-speed Internet.

The Challenge

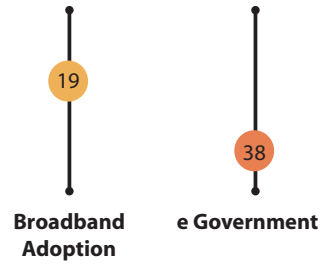
For the state to achieve a competitive advantage in the digital age, it will require collaborative action in the digital education of its citizens and e-government efficiency – two areas in which Rhode Island and the U.S. lag behind. Despite great Internet connectivity, more Rhode Islanders need the tools to use these technologies to help improve their lives through online learning, securing jobs, and accessing government resources.

Sources: Broadband Speed ranked by Pando Networks. Coverage ranked by ITIF / Kauffman New Economy Index. Broadband Adoption ranked by NTIA 2010. State e-government ranks from the Center for Digital Government.

Rhode Island's 50 State Rank

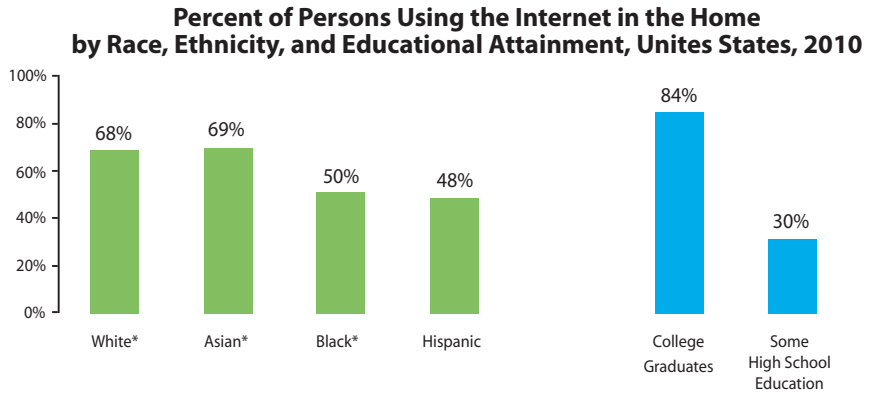


Rhode Island's 50 State Rank



The Digital Divide

Rhode Island faces a critical digital divide between those who have the skills to utilize Internet technology and those who have not. Much work remains to be done to bridge that divide so all of our citizens can connect to their communities, government, and social support networks. Coverage makes broadband access possible, but broadband adoption is the goal. As of 2010, an estimated 71% of U.S. households use broadband –29% do not.



non-Hispanic. Source: U.S. Department of Commerce, NTIA, 2011, "Digital Nation, Expanding Internet Usage."

What Rhode Island is Doing

For 2010-2014, the federal government, through the National Telecommunications & Information Administration (NTIA), has granted Rhode Island $27.8 million for broadband infrastructure, access, digital literacy, and organizational capacity building to give more Rhode Islanders the opportunity to participate in the digital age.

Of that federal funding, $4.52 million went to establish the Broadband RI (BBRI) initiative within the RIEDC. BBRI works to create new opportunities by expanding broadband use and digital literacy across Rhode Island. BBRI programs address public awareness and education about broadband and develop plans to increase broadband adoption and usage.

Also with federal support, OSHEAN (Ocean State Higher Education Economic Development and Administrative Network) is deploying 389 miles of high-speed optical fiber throughout the state and Ocean State Libraries is adding 600 new computers and 12 mobile computing labs to the state's public computing resources.

Broadband Opportunities for Rhode Island

To build on the work funded by NTIA through 2014, the State of Rhode Island should take a long-range leadership role in bringing public and private-sector stakeholders together to develop integrated strategies to extend the advantages of living in a broadband connected community to support civic engagement, economic growth, a better quality of life and life-long learning for all Rhode Islanders.

Key Recommendations

- ***Collaborative Leadership***

  A critical first step would be to constitute a high-level interagency body - a Governor's Broadband Policy Advisory Board - with appointed public and private leadership to support collaboration around e-government innovation, broadband adoption and educating digital citizens. The board would develop collaborative opportunities with a high return on investment and guide Rhode Island's competitive application for what could be billions of dollars in future nationwide federal funding through the Connect America and other FCC/NTIA programs. The board could receive technical support from the state Office of Information Technology and BBRI. No new state funds would be required.

- ***e-Government Innovation***

  Support agencies in adopting service delivery models that use broadband to improve service while reducing costs. The immediate priority is supporting the RI Department of Education's integrated efforts under Race to the Top to build a next generation information system to support education.

- ***Digital Citizens***

  Support and publicize education in digital literacy across multiple forums so that Rhode Islanders will gain the know-how to take advantage of the Internet. BBRI is developing a curriculum and mobilizing a volunteer training network through community organizations and libraries. This program will increase constituent awareness of the resources available to them through the Internet.

- ***Support Internet Access for All Rhode Islanders***

  Update Rhode Island's educational and library broadband technology funding stream by amending the RI-TEAF telephone surcharge to include cell phones. A decade of work by OSHEAN and Ocean State Libraries has created a network of points of free public broadband access. Updating RI-TEAF, the educational technology funding stream, is the simplest step to enable Rhode Island to maintain public Internet access points with up-to-date operating systems and connection speeds and continue to access federal e-rate matching funds. RI-TEAF will continue to decline as people switch to cell phones unless the telephone surcharge is updated to include cell phones.

- ***Adopt a Sustainable Funding Model for Internet Enabled Public Services***

  The state needs to spend money on technology to save money. Rhode Island needs to supplement general funding revenue with diverse technology funding mechanisms including a modified RI-TEAF surcharge and capital financing for high ROI projects. Investments and planning will help position Rhode Island to access Connect America and other future FCC/NTIA funding.

Conclusion

Rhode Island has a window of opportunity to turn its lead in broadband infrastructure into a clear competitive advantage by accelerating progress toward universal access, educating digital citizens, and deploying e-government applications. Constituting a "Broadband Policy Advisory Board" will be central to assuring that the best thinking of public and private leaders is brought together around these challenges. These efforts will extend the advantages of living in a broadband-connected community to support economic growth, quality of life, lifelong learning, and a vibrant digital culture in which citizens engage with their government and community online.

VISION

Rhode Island will increase the number of digital citizens who use broadband to increase productivity, enhance quality of life, and benefit society.

Broadband RI Public Policy Engagement Process with New Commons.

Broadband Policy for Rhode Island

Achieving Competitive Advantage in the Digital Age

INTRODUCTION

Broadband Internet is the new indispensable infrastructure for the flow of commerce, communication, government services, and information of all kinds. Because the Internet has become essential to full participation in public life, the United States of America is committed to achieving universal broadband access similar to that available in other advanced world economies. For 2010-2014, the federal government has granted Rhode Island entities $27.8 million for broadband infrastructure, access, digital literacy, and organizational capacity building to give more Rhode Islanders the opportunity to participate in the digital age. This substantial federal commitment to broadband will contribute to technological advances, innovation across economic sectors, and overall national economic competitiveness.

"We are going to see broadband evolve as a utility – a basic piece of infrastructure not unlike the public water supply. It is the conduit – without it, information can't flow. And like the water system, it will shape the way we build communities."

- Jared Rhodes, Chief, Statewide Planning

State governments have a high-stakes role to play in educating digital citizens and using the Internet to transform the public and private sectors. The Internet is the key enabling technology to address many public policy and economic development challenges faced by the State of Rhode Island: delivering effective and affordable health care, transforming our educational system, and delivering government services within tight budgets. These benefits become achievable when virtually all citizens have the access and know-how to tap into the Internet. Because Rhode Island is a leading state in broadband speed and coverage, it is well positioned to achieve competitive advantage in the digital age; success will require, among other things, collaborative action in digital education and e-government. If Rhode Island is complacent about its broadband strategy, our state will increasingly face a divided citizenry of digital haves and have-nots. Failure to leverage the capabilities of digital infrastructure and keep pace with the leading innovative regions of the world could set Rhode Island further back through lagging productivity, higher taxes, fewer services, and becoming a less attractive place to work and live. This is too great a risk facing policy makers and citizens.

In mid-2011, Broadband RI (BBRI) convened stakeholders from throughout the state to shape a policy roadmap. Participants focused on policies to broaden adoption of high-speed Internet and increase the sophistication of public broadband applications. The group emphasized the value of leveraging the OSHEAN Beacon 2.0 network which was funded by the federal government to connect community anchor institutions (fire departments, police stations, libraries) throughout the state. They articulated a community vision: Rhode Island will increase the number of digital citizens who use broadband to increase the state's productivity, enhance quality of life, and benefit society.

WHY DO ALL RHODE ISLANDERS NEED BROADBAND AND THE SKILLS TO USE IT?

Broadband matters because of the opportunities it creates. By enabling the automation of routine tasks, expanding access to information and services, overcoming distance, and enabling collaboration, the Internet is a powerful platform for service delivery, innovation, and interaction. Today a majority of people have experienced the value of broadband applications for communication, finding directions, shopping, and entertainment. The commercial sector has invested heavily in creating high-value uses of broadband, but

the potential for public purpose applications is also great. Next-generation applications are in development for education, health care, public safety, and community engagement.

The benefits of the networked world are multiplied as more individuals and organizations have the access, skills, and motivation to use online information sources and tools. For schools, health care facilities, and government agencies to fully benefit from these capabilities, their constituents and students must become digital citizens – with Internet access AND know-how.

Rhode Islanders who do not use the Internet are at a significant disadvantage in terms of their access to information and services, and their ability to engage with civic institutions. This "digital divide" between those who benefit from digital technology and those who do not is a growing issue. The longer we wait, the harder it will be to close this divide. Governments around the world are acting to accelerate broadband adoption and leading with public policy innovations to achieve this goal.

"We need to break down barriers about the haves and the have-nots. Rhode Island's broadband policy needs to provide capabilities that everyone can use with no class differences. What is at stake is our ability as a society to communicate. This is the backbone of everything we do in healthcare and emergency medical services."

David Hemendinger, former Chief Technology Officer, Lifespan

BROADBAND IN RHODE ISLAND

Because the state is extremely well-positioned in terms of broadband infrastructure and diversity of carriers, Rhode Island is poised to take on the challenges of digital literacy, broadband adoption, and development of civic and public service applications.

Rhode Island's compact geography and many institutions of higher education have helped put it ahead of the curve in broadband infrastructure thanks to the effort of at least 19 broadband carriers doing business in Rhode Island in 2011. Broadband users in Rhode Island experience the highest connection speeds measured among U.S. states according to Pando Networks. Moreover, using U.S. Department of Commerce National Telecommunications and Information Administration (NTIA) definitions, as of 2011 Rhode Island has 97% broadband coverage.

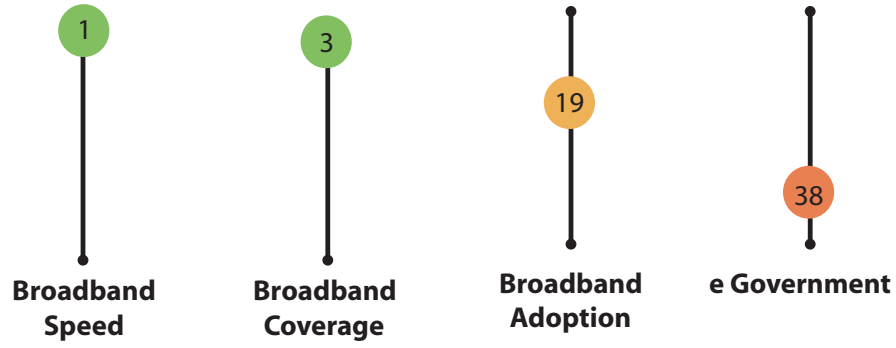
The leadership of the OSHEAN consortium has also significantly enhanced Rhode Island's network resources. OSHEAN members have been working together for a decade on ways to provide affordable advanced

WHAT IS BROADBAND?

Broadband is high-speed "always on" Internet service with the capacity to deliver rich content. Broadband can be wired or wireless and be transmitted by cell phone networks or satellites. "Always on" means it does not block phone lines and there is no need to reconnect to the network after logging off. Broadband provides access to streaming media, VoIP (Internet phone), gaming, and interactive services. Many of these services transfer large amounts of data and do not function with dial-up service. Today Internet use is primarily broadband use, with 68% of U.S. households reporting broadband use and 71% reporting Internet use in the 2010 Census Population Survey. Speed varies among broadband connections. The 2010 National Broadband Map 2010 defines broadband as download speeds greater than 3 Mbps (megabits per second) and upload speeds greater than .768 Mbps. The National Broadband Plan, unveiled March 16, 2010 set the goal of 100 Mbps connections with upload performance of at least 50 Mbps. As more data is transmitted via the Internet these basic thresholds are likely to increase.

broadband to education and research institutions throughout Rhode Island. Through the $21.7 million Broadband Technology Opportunities (BTOP) grant, OSHEAN is installing 389 miles of fiber throughout the state to increase network capacity and expand their services to include more community anchor institutions including libraries, K-12 schools, public safety entities, and other public service organizations. OSHEAN's dedicated fiber optic network will have an initial capacity of 400 gigabytes per second, allowing schools and libraries to connect at 1,000 megabits per second, 50 times faster than the speeds being offered to homes in Rhode Island. University researchers and hospitals will be able to connect at 10,000 megabits per second, thus enabling them to connect to high performance computers for research, and to move volumes of digital images.

Rhode Island Ranks High in Broadband Speed and Coverage, Low in e Government



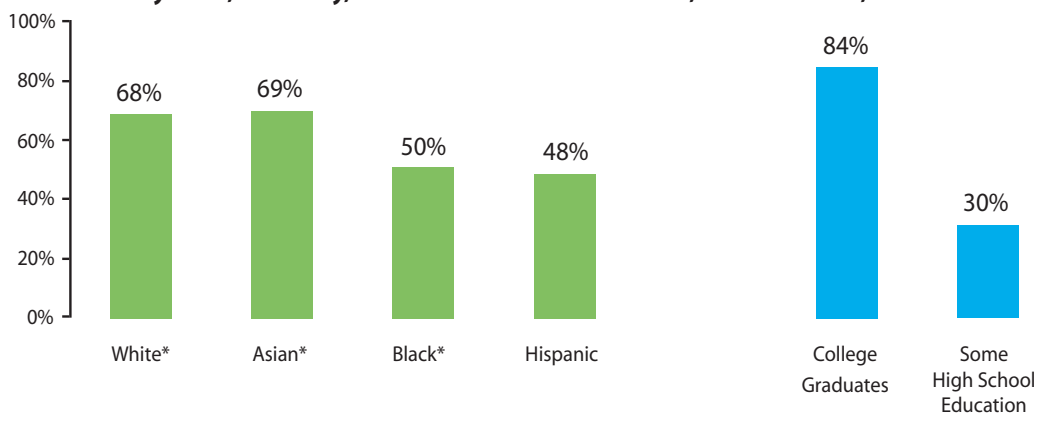
Sources: Broadband Speed ranked by Pando Networks. Coverage ranked by ITIF / Kauffman New Economy Index. Broadband Adoption ranked by NTIA 2010. State e-government ranks from the Center for Digital Government.

Despite Rhode Island's high ranks in broadband coverage and speed, the state has much work to do close the digital divide with respect to broadband adoption. As of 2010, an estimated 71% of Rhode Island households have broadband –29% do not. This digital divide primarily runs along education and income lines. Using national data, people with college degrees adopt broadband at almost triple the rate of those with some high school education (84% versus 30%). White and Asian populations have higher rates of broadband adoption than Black and Hispanic populations. Bringing the 29% into the digital world would greatly enhance their opportunities to compete for jobs, pursue education, access information, and engage with the wider community.

"Broadband can empower more people, especially the low-wage earner Americans to become contributors to the evolving 21st century U.S economy and civic participation for a better quality of life."

Juan M. Pichardo, RI State Senator District 2 Providence, President Pro Tempore

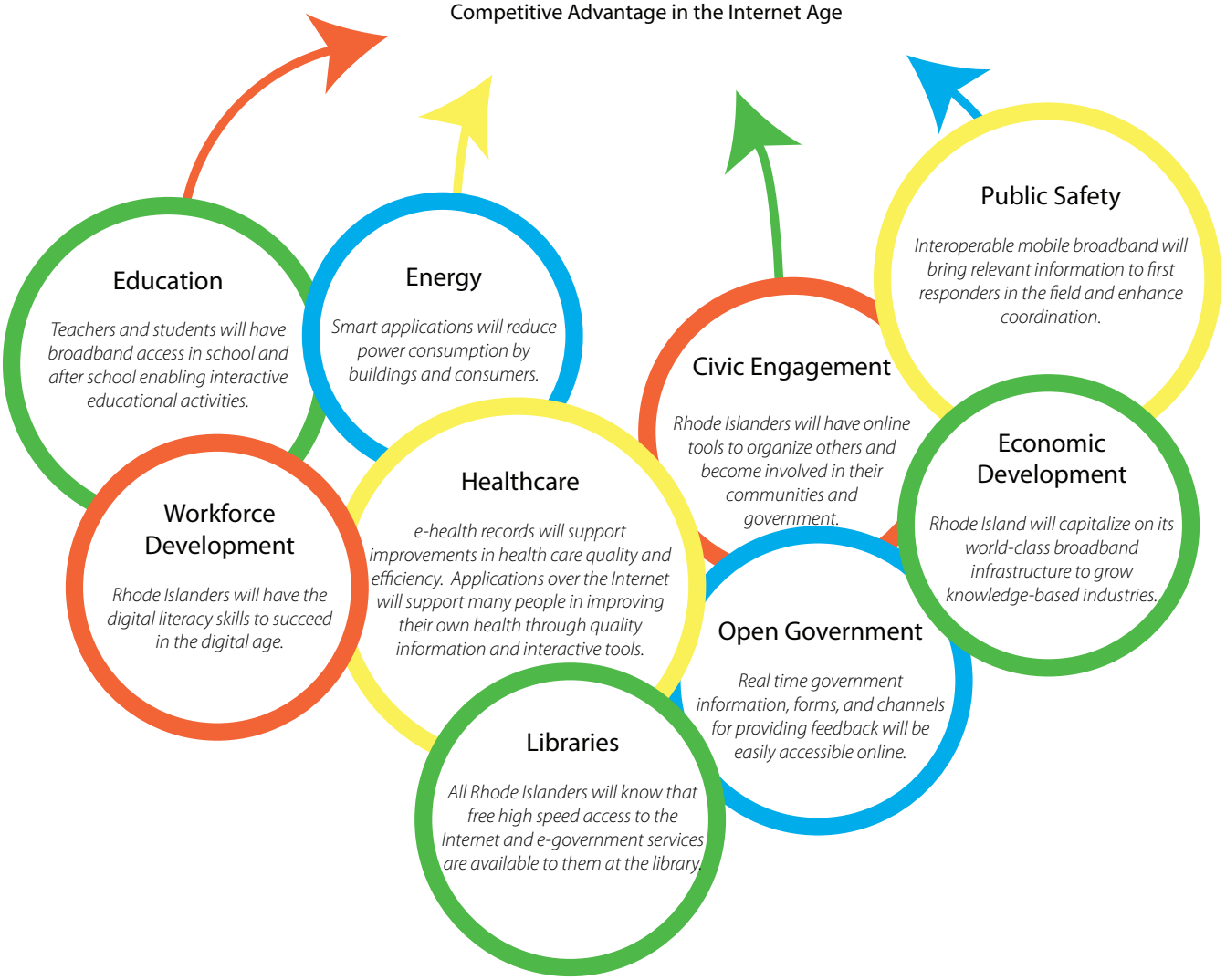
Percent of Persons Using Internet in the Home by Race, Ethnicity, and Educational Attainment, United States, 2010



**non-Hispanic. Source: U.S. Department of Commerce, NTIA, 2011, "Digital Nation, Expanding Internet Usage."*

Why Broadband Matters

Competitive Advantage in the Internet Age



BROADBAND POLICY SUPPORTS INNOVATION ACROSS SECTORS

Economic Development

Broadband connectivity is part of the package of amenities that knowledge businesses need to grow. High-speed broadband is one of the attractions of Providence's Knowledge District, made possible partly because of the collaborative investments by anchor institutions of hospitals and universities. High rates of broadband use by the public will provide expanding market opportunities for Rhode Island companies, and provide an environment that will encourage businesses to embrace e-commerce.

Rhode Island is experimenting with e-government solutions to enhance the delivery of economic development services with the creation on an online business incubator. This collaborative project between Broadband RI and Social Venture Partners combines online learning tools with in-person mentoring to coach new urban entrepreneurs through a 12-week intensive business start-up process. The Online Business Incubator goals include helping companies develop an effective web presence and significantly increasing their use of broadband.

Economic Development

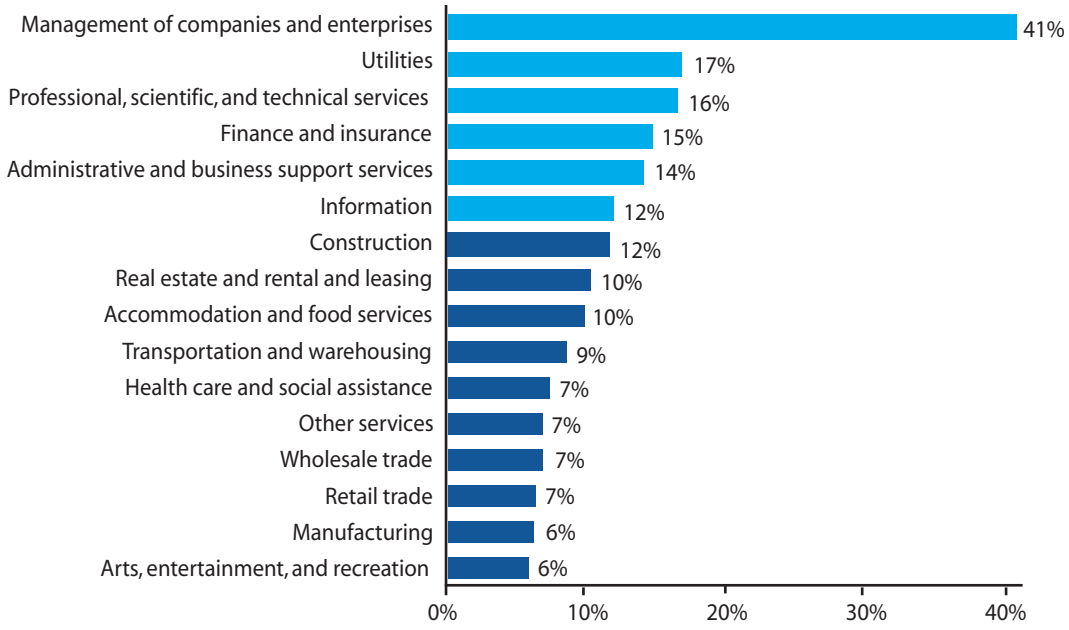
Rhode Island will capitalize on its world-class broadband infrastructure to grow knowledge-based industries.

"Rhode Island can lead the way on Broadband, which is an issue that should interest us all. It's one of the keys to America's economic prosperity. We are training digitally, growing opportunities for small business and entrepreneurship through digital innovation, and creating new opportunities for our future workforce."

Juan M. Pichardo, RI State Senator District 2 Providence, President Pro Tempore

While the full economic benefits of broadband are hard to measure, there are a number of studies that have documented the impact of broadband coverage on job growth. A national study by the Brookings Institution estimated that for every 1% increase in broadband adoption in a state, employment would increase between 2 and 3 percent per year. In Rhode Island, this would translate into 1,100 new jobs per year. A study by the Public Policy Institute of California looked at job growth relative to broadband coverage, and found that increases in the number of broadband

Employment Growth Associated with Broadband Availability by Industry, 1999-2006



Source: Kolko, Jed. January 2010. "Does Broadband Boost Local Economic Development?" Public Policy Institute of California.

providers caused the area to have higher job growth controlling for factors such as population growth. The relationship was strongest in industries with high technology inputs and a high share in computer occupations.

Workforce Development

The workforce system faces a digital divide challenge and an innovation challenge. Addressing the digital divide is an important workforce development issue because the majority of occupations require increasing levels of digital literacy. Existing ethnic and racial disparities in Internet use have important consequences as Rhode Island's emerging workforce is increasingly Hispanic. The total number of white non-Hispanic high school graduates in Rhode Island is projected to decline, while the number of Hispanics will rise. Even at the entry-level, broadband is a gateway to workforce education and career advancement. The whole job search and application process has moved online. Many of the services offered by public workforce one-stop centers are significantly extended through web-based applications and tutorials.

Workforce Development

Rhode Islanders will have the digital literacy skills to succeed in the digital age.

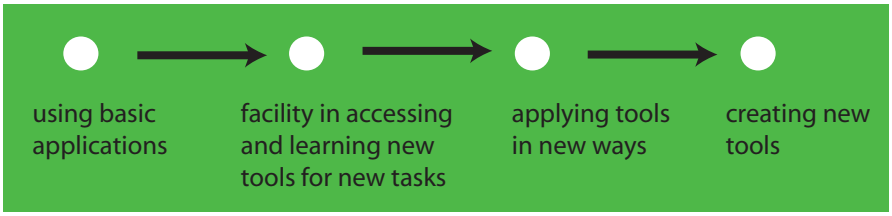
"The successful growth of our workforce depends in large part on providing all Rhode Islanders with greater access to the technologies and training they need to compete and succeed in the 21st century economy. By focusing strategic efforts on closing the digital divide, Rhode Island will help workers gain the online skills and know-how to find and secure career advancement opportunities, grow or start their own businesses and supply the ready talent pool needed to grow our state's key industries."

Keith Stokes, Executive Director, RIEDC

Digital literacy is a continuum that begins with the basics of navigating online information and continues to active participation in digital innovation. Rhode Island's economic future depends on the ability of the workforce to put technology to productive use and participate in this innovation. The Tech Collective, Rhode Island's technology industry association, has documented the importance Rhode Island employers place on skills such as the facility of learning new tools for new tasks, the ability to think creatively to apply tools in new ways, and the innovation skills to create new tools to fuel company growth.

Open Government and Civic Engagement

Continuum of Digital Skills



Broadband allows for fast access to information, facilitates online transactions, and enables public engagement. At every level of government, the Internet is the preferred method for communication between government and citizens. It increases citizen access to information 24/7 and allows government agencies the ability to provide more interactive constituent services. Real-time information accessible via the Web on proposed legislation, legislative process, new laws, policy-making, budgeting, and expenditures, shines light on the actions of government.

Rhode Island was one of the first states to create a government transparency portal (www.ri.gov/opengovernment/). This portal provides a searchable database of payments to vendors. Migrating purchasing online is another goal. Larger bids are already processed online and the state is in the process of redesigning purchasing processes via the Web. Another good example of open government is Rhode Island's absentee voter system allowing voters to download ballots via the Internet. This change reduced a barrier to voting by Rhode Islanders stationed abroad.

Civic Engagement

Rhode Islanders will have online tools to organize others and become involved in their communities and government.

RI.gov serves as a portal to all state department websites, making it easy for citizens to access information at one central location; over 100 services are offered through RI.gov. User fees fund the development of the RI.gov site and the backend systems to support online services. The United Way of Rhode Island runs an important complementary portal initiative, 2-1-1, which provides phone and online services to navigate both public and private social services statewide.

The RI Geographic Information System (RIGIS) is an example of broadband vastly expanding the capabilities and coordination of government agencies. Current versions of map data created by and used by all state departments, cities, and towns can be downloaded from RIGIS via the Internet and incorporated into custom maps. The next step for this system is to adopt an enterprise GIS within state government to economize on computing resources and enable all map projects to use a live link to the most current version.

Open Government

Real time government information, forms, and channels for providing feedback will be easily accessible online.

Challenges for open government include leadership to drive interagency collaborative efforts, investment capital to build applications, and closing the digital divide. State and local governments are just beginning to scratch the surface of the potential of broadband to support transparency and public engagement.

"If the State fails to take advantage of the efficiencies and automation potential of the Internet, Rhode Island government will be more expensive in the future and citizens will have fewer services."

Howard Boksenbaum, Chief Library Officer, Office of Library and Information Service

The libraries in the Ocean State were early adopters of broadband technology; they serve as a shining example of how public services can be completely transformed through enterprise technology and the Internet. All our public libraries have high-speed Internet access. More than 1.5 million items annually are sent through the statewide interlibrary loan system. Rhode Island's libraries provide free access to subscription online resources for learning foreign languages, English for speakers of other languages, homework help, test prep, and a variety of references that can be accessed in the library or at home by library cardholders. Howard Boksenbaum, Rhode Island's Chief Library Officer, speaks of libraries as "opportunity places." Libraries are not only free points of access to the Internet, but they offer free workshops that cover a wide range of digital literacy skills. Library computers give residents access to the online resources of the netWORKri Centers, essentially making these services available in every community in the state. One extension of service funded through a recent federal BTOP grant are the Ocean State Libraries' 600 new computers and 12 mobile computer labs: these kits of ten computers each can be borrowed by any public library to provide computer and Internet access for workshops and events in a wide range of spaces.

Libraries

All Rhode Islanders will know that free high speed access to the Internet and e-government services are available to them at the library.

Challenges for libraries include growing content, improving and adding facilities to provide more Internet access and training, maintaining hardware with up-to-date operating systems, and expanding hours of operation. Beyond resource constraints, libraries are working to increase awareness of the range of services they provide.

Public Safety

Broadband can support the work of police, fire, EMS, and disaster response personnel in a variety of ways. Broadband has been used to provide emergency notification to the public, enhance training resources, improve situational awareness with real-time information, and assist in resource deployment to improve response times. For example, mobile broadband can improve situational awareness with maps, building plans, utility information, and access to databases on chemicals and other known hazards. Broadband can transmit mug shots of suspects to personnel in the field and also enable public safety personnel to receive texts, photos or video sent to law enforcement by citizens. In the future, broadband potentially could provide connectivity to emergency medical personnel to support remote diagnostics and treatment.

For these benefits to be realized in Rhode Island there needs to be continued investment in resource sharing, integration of security hardware, systems architecture, and software between emergency responders, hospitals, and other service providers. These increasingly sophisticated applications also require high bandwidth. Another front-burner issue for public safety is analysis of cyber security of infrastructure.

Public Safety

Interoperable mobile broadband will bring relevant information to first responders in the field and enhance coordination.

Health Care

Health care and social assistance are the largest industry sector in Rhode Island, accounting for 78,000 employees and more than 17% of Rhode Island employment in 2010. Broadband can improve health care outcomes while simultaneously controlling costs and extending the reach of the limited number of health care specialists. A 2005 study estimates that broadband could save the American health care system $30 billion per year in reduced medical costs through smart use of electronic medical records, remote health monitoring, and other broadband health applications.

Rhode Island is already reaping the benefits of a robust infrastructure that allows communication between core acute care hospitals and affiliated physician practices. Rhode Island health care providers have also invested in the conversion to digital medical records, which is improving access to patient records, reducing errors, and supporting coordination around patient care.

For the last two years, ambulances throughout Rhode Island have used laptop computers connected through wireless broadband. These broadband-enabled devices allow for instant access to patient information, and save critical seconds during emergency response situations. The architecture to support this first-of-its-type service was created through a federal grant to Rhode Island Hospital.

Rhode Island also has a Health Information Exchange, currentcare, that individual Rhode Islanders can opt into. This secure electronic network gives doctors and other health care providers access to the most up to-date health information, ensuring each patient is treated with the best possible care. The benefits of currentcare include:

1) Safety: Practitioners have up-to-date patient information including tests and prescriptions from other specialists who have been part of the treatment team.

2) Efficiency: currentcare eliminates wasteful duplication of lost lab results or missing x-rays. It allows doctors to spend less time shuffling paper and more time attending to the patient. It cuts wait times for test results.

3) Collaboration: currentcare enables better coordination and

Healthcare

e-health records will support improvements in health care quality and efficiency. Applications over the Internet will support many people in improving their own health through quality information and interactive tools.

collaboration between multiple health providers on a patient's care. It enables physicians to better treat the whole person by seeing the complete picture.

The adoption of a system of unique, personal identification numbers (PINs) recognized across health care systems is one of the more important solutions currently under consideration within the health care sector. PINs would enable patients to be accurately matched with digital images and health care records created by different providers. For example, it would enable hospital personnel to access medical records for patients who come in for emergency treatment away from home, possibly with life-saving consequences.

These broadband-enabled innovations place more meaningful information in the hands of healthcare practitioners and the patients themselves. These efforts support healthcare providers in educating patients and engaging them in their own care.

Other areas that might provide value in Rhode Island in the future include telemedicine and remote patient monitoring. Canada and various areas within the U.S. are more advanced in telemedicine and have proved its usefulness. Although Rhode Island does not have vast distances to overcome, telemedicine could provide efficiencies in Rhode Island by giving health care personnel the tools to perform follow-up check-ups, especially for patients with limited mobility. Barriers to telemedicine include concerns about privacy, rules for billing telemedicine, and the knowledge and experience of the healthcare workforce.

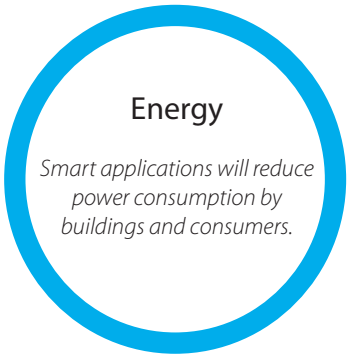
Energy Management

Increased energy costs have spurred innovation in smart tools to improve energy management. Smart Grid initiatives aim to use the power grid's communication system to maximize energy efficiency. This experimentation includes ways in which broadband can enable continuous monitoring of energy usage and use smart applications to help residents and property managers gain better control of usage and costs. While these initiatives are in their early stages, such tools could contribute to cost savings for public facilities. With steeply rising energy expenditures draining $4.9 billion from the Rhode Island economy in 2010, this area of innovation could have a significant positive economic impact on the state.

Education

The applications of broadband to support education are impressive. For the elementary and secondary school system, the most obvious benefit is to enrich classroom learning activities with external resources and interactive activities. Leaders at the Rhode Island Department of Education (RIDE) want to provide sufficient bandwidth to all Rhode Island schools and extend connectivity into classrooms through wireless networks. This capability will enable untethered teaching and opens up new possibilities for creative, connected, and inspired learning through computers and the Internet. Broadband technology in the classroom will enable teachers to enrich common core subjects and help all students develop stronger digital literacy skills.

Some of the drivers of broadband deployment in schools include the move to e-textbooks, web-based standardized testing, and more sophisticated data reporting systems. Today college-bound students take standardized tests such as the SAT online. To develop assessments for the Common Core Curriculum, Rhode Island has joined the Partnership for Assessment of Readiness for College and Careers (PARCC). Rhode Island and the other 22 PARCC states plan to use web-based assessments as soon as the technology can be made available in schools. Every student in a grade will need an Internet connected device to access the test simultaneously.



"Broadband can be a tool to put the joy back into learning."

Terry Feeley, Director, New Ventures of Rite Solutions

Education

Teachers and students will have broadband access in school and after school enabling interactive educational activities.

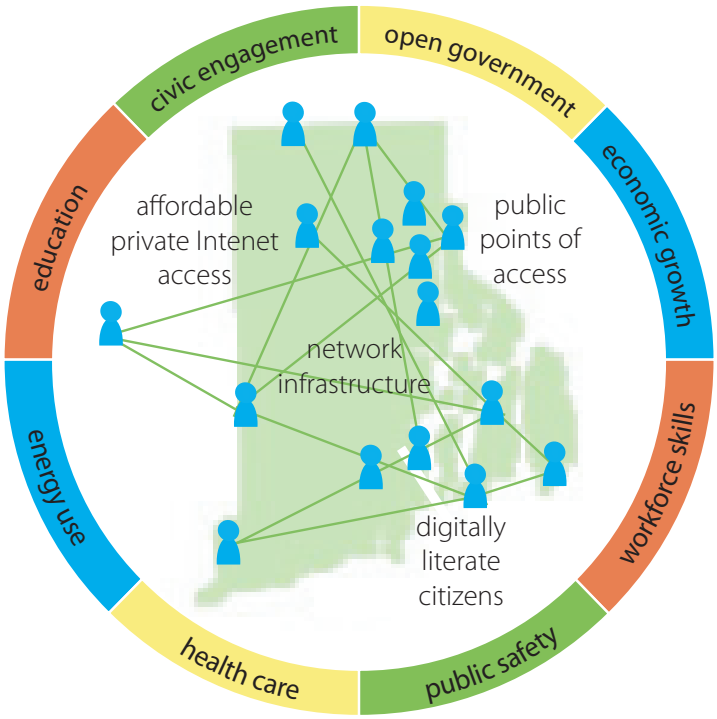
Universal access is the fundamental problem for schools trying to educate Rhode Islanders for the digital age. Students from affluent families have had the benefits of computers at home for schoolwork for a quarter century and Internet access at home for over 15 years. Yet in 2011, most classrooms do not have the technology to incorporate computers into the curriculum. In 2011 teachers still design homework requirements assuming that not all students will have access to computers and the Internet at home; interactive learning games, e-textbooks, and other resources are offered as optional supplements rather than integrated directly into the curriculum. This limited integration of computers and broadband Internet into education perpetuates the digital divide, graduating high school classes of students whose digital literacy skills are correlated with the education and income of their parents. Students who have developed weak digital literacy skills are highly disadvantaged in college and the workforce.

"Broadband is critical in light of Race to the Top and the data systems the Department of Education is building. We will have real time data tools in the hands of teachers, parents, and administrators."

Carolyn Dias, Director of Finance, RI Department of Education

Virtual education is another promising frontier. Broadband can give every high school student in the state access to broader educational opportunities through online courses without leaving their local public school. Virtual high schools can economically expand course offerings available to all students. Virtual high schools provide college bound students access to advanced or specialized coursework. Virtual high schools also help retain students at risk of dropping out by enabling credit deficient students to take specific courses required to graduate and enabling home bound students and teen parents to take classes from home. While not universally available, virtual learning is expanding opportunities for secondary schools in Rhode Island.

Broadband is also important in supporting education management and reform. Rhode Island Department of Education is building a data enterprise system that will meet and exceed the requirements of education reform. The system will have a number of platforms including an instructional management system with tools for teachers to assess and track student progress. Rather than preparing reports that are six months out of date when published, this data system will put more real time data in the hands of teachers, parents, and administrators. Going forward, the Department of Education is asking for a $20 million bond to create wireless classrooms. In addition, the Department requires $1 million to leverage federal e-rate funds and make up for the diminishing RI-TEAF funding stream.



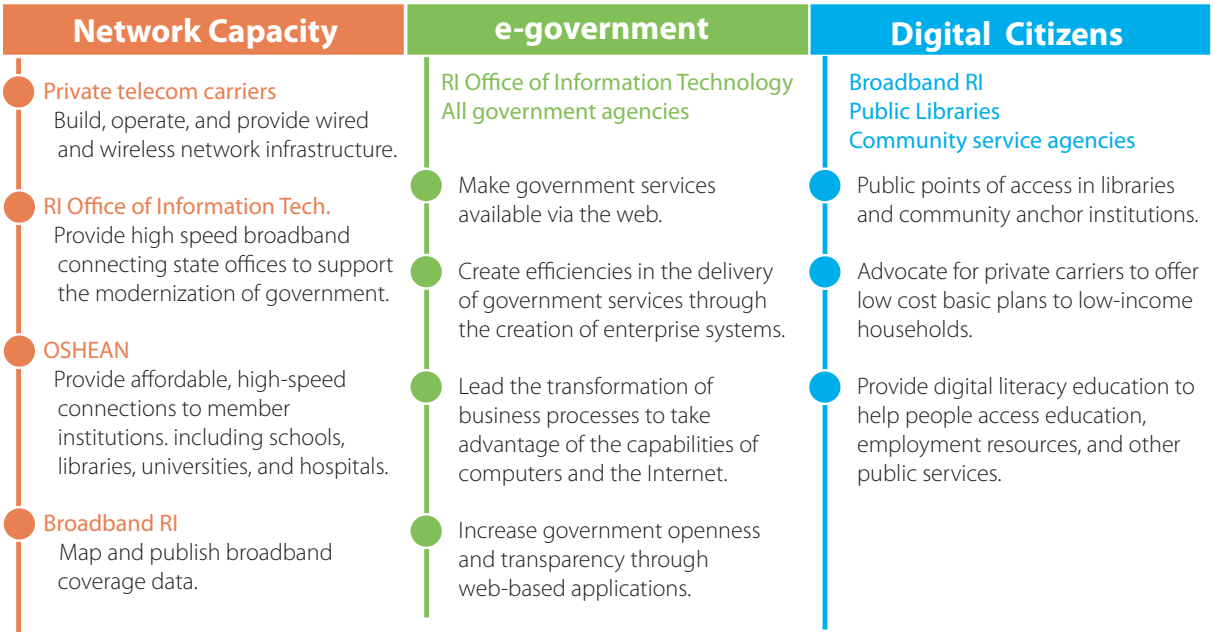
BROADBAND POLICY OPTIONS

Because governments are focused on economic growth, improving education, and cost-effective public service delivery, broadband policy is a priority for many governments around the globe. Broadband policy encompasses innovation in government use of networked information technology, but also the empowerment of digital citizens. States are moving from a model that views IT as a support function to a model that reaches beyond the walls of government to enable whole systems innovation. The leading states in innovative e-government have broadband policy bodies strongly supported by top-level state leaders.

The leading states are constantly striving to improve performance on three different levels: 1) world-class information technology (IT) resources to support government, 2) transforming government processes through technology and the Internet, 3) deploying new tools to support citizen engagement, and 4) full-system innovation enabled by IT in close collaboration with community partners. The office of Information Technology is responsible for achieving efficiency and high performance in the acquisition and management of state IT. This involves IT governance managed by the state CIO, joint purchasing, shared services, the development of enterprise systems, consolidated infrastructure, and increasingly, the application of virtualization. The State Office of Information Technology works in close collaboration with state departments to transform government programs and their underlying business models through IT-enabled innovation and improvement. This requires collaborative organizational relationships within government and with its vendors. Examples include the consolidation of licensing systems through the RI.gov portal. Full system innovation enabled by technology requires the highest level of leadership and relationship building to address essential public goals like prisoner re-entry from the client and community perspective rather than from within the perspective of an agency. Networked IT solutions can be designed to support whole system outcomes. Through its research of state IT functions, Tech America (2010) found that "While most states and many municipalities have moved down the path toward cost containment through the use of IT, efforts aimed at transforming programs and support operations have not been as widespread."

The Scope of Broadband Policy

Broadband policy is concerned with improving the delivery of essential public services through the Internet. This requires public-private collaboration around network infrastructure, e-government, and the empowerment of digital citizens.



To be innovative with the application of broadband to build communities and transform processes requires considerable cross-department communication and big picture thinking. Rhode Island is already advantaged because of the inter-agency collaboration supported by the Office of Information Technology. The leading states do not just provide enterprise systems and connectivity to serve the needs of state agencies, they are committed to changing the underlying business processes in combination with new digital tools. They work to support a culture of innovation within government. Playing this high-level role requires strategic planning, high-level champions, benchmarking (to keep an eye on evolving best practices), and sustainable funding.

Broadband Policy Bodies

A broadband policy body is critical to address issues of expanding broadband adoption that cross the boundaries of many agencies. Those issues include affordability, standards for public Internet access, and reducing barriers that limit infrastructure. Our research on state broadband programs in the United States shows that 29 states have legislated bodies addressing broadband issues in their states and another 11 states have bodies created by executive order – bringing the total to 40 out of 50 states. Rhode Island has yet to establish such a body.

"Broadband has transformative power because it brings necessary real-time communication and transparency to larger processes. Collaborative web-based tools can enable the kind of productive collaboration that is characteristic of a close-knit team for a larger and more distributed team. "

Terry Feeley, Director, New Ventures of Rite Solutions

The 2010 Digital States Survey recognized Utah and Michigan as the top ranked states for demonstrating results across all categories of e-government. They were modernizing IT systems "to realize operational efficiencies and strategic priorities under nimble leaders." They showed evidence of meaningful collaboration. They use performance metrics and budget cuts tended to be made strategically rather than across the board. They have strategic collaborations involving multiple agencies and stakeholders. Importantly they treat government information technology and broadband as central to government rather than an add-on. These states provide different models for convening broadband policy bodies, Utah has a Broadband Advisory Board and Michigan has a Collaborative Broadband Committee.

Michigan. Michigan has made technology central to government management by creating the Department of Technology, Management, and Budget in 2010. The state's technology framework was created by a large team of stakeholders representing many groups from around Michigan. The vision of the State of Michigan is to provide broadband coverage to every corner of the state:

- Expanding and upgrading broadband service to unserved/underserved
- Transforming Michigan's economy and technology infrastructure
- Ensuring government efficiency
- Strengthening public safety and homeland security

Connect Michigan was created as a not-for-profit organization by the Michigan Public Services Commission to perform broadband mapping. Connect Michigan and the Public Services Commission convene a Collaborative Broadband Committee monthly to provide guidance and solutions to broadband challenges. The Collaborative Broadband Committee brings together representatives from K-12 education, higher education, healthcare, broadband service providers, non-profits, tourism, business, agriculture, government, and other organizations that have an interest in improving Michigan's broadband availability and adoption.

Utah. Utah has a Broadband Advisory Council that meets monthly to examine the condition of broadband adoption and deployment in the State of Utah and provide the Governor and Legislature with recommendations and policy guidance. Members of the Council represent a diverse group of interests including legislators, economic development, state and local government, healthcare, education, libraries, public safety, and tribal entities. Utah's Broadband Project is a joint effort between the Governor's Office of Economic Development, the Public Service Commission, and the Department of Technology Services.

Expanding Broadband Adoption

While providing free access to shared computers and Internet connection at libraries and other community centers is today's method of addressing the digital divide, many policy leaders seek ways to increase private access to the Internet. Using computers in public locations creates privacy and personal identity security issues for entering credit card numbers, filing taxes, banking, accessing health care information, and conducting other personal business. The public policy debate remains whether the public interest requires all citizens to have private access to the Internet much like everyone in the country has access to telephones in their home, and if so, how can that best be achieved.

The Information Technology and Innovation Foundation advocates the creation of low cost, basic Internet service plans for low-income households. As a condition of a recent approval, the Federal Communications Commission (FCC) asked Comcast to create such a plan, resulting in Internet Essentials (www.internetessentials.com). This plan provides high-speed home Internet service for $10 a month and a computer for $150 for families with at least one child receiving free lunch from the National School Lunch Program. While other companies have similar programs, including companies offering service in Rhode Island, one has yet to take a leading Connect to Compete Initiative (C2C) role within the state. In October 2011 the FCC announced C2C to increase broadband adoption in underserved communities through 1) affordable broadband and computing devices, 2) digital literacy training, and 3) relevant applications and content. The initial phase of the initiative will focus on improving the capacity of care-givers to engage with their children's education; enhancing schools' ability to communicate with students and parents, encouraging active learning outside the classroom; and increasing students' ability to learn through technology applications. This effort will be piloted and rolled out with a coalition of local partners.

Sustainable Technology Funding Mechanisms

Individual Rhode Island websites have been recognized for standout e-government services. For example, RI.gov was recognized as one of the top five state web portals by the Digital State's Survey 2011 Best of the Web Awards. Nevertheless, the 2010 New Economy Index ranks Rhode Island below average (38 out of 50 states) in e-government applications. RI.gov is entirely self-funded through user transaction fees while overall Rhode Island struggles with funding investment in government information technology.

While automating transactions reduces state operating costs, such systems require upfront expenditures for development and infrastructure. The state contractor responsible for RI.gov is able to provide the development capital for applications, which is paid back over time by users. For example, Rhode Island's Department of Motor Vehicle system was financed with user fees. Many states have received push-back from citizens over fees for Internet transactions because these service reduce the transaction cost for government. However, in the short term such fees can be acceptable if they are less than what it would have cost the customer to travel to complete the transaction in person or to mail the materials.

States need to spend money to save money. States need a long-term investment approach to funding multi-year technology and infrastructure projects that considers full life-cycle costs and benefits. States that fund technology primarily through general fund appropriations are falling behind in technology applications. The 2008 survey by the National Association of State Chief Technology Officers (NASCIO) revealed a trend toward innovative and alternative funding models that supplement the expenditure of general funds on information technology. Alternative funding mechanisms include technology bonds, benefits funding, user-fees, multi-year budgeting strategies, and public-private partnerships. Thirty-four out of 50 states use two or more alternative technology funding strategies in addition to general fund appropriations (Khanna 2008).

Rhode Island's revenue stream for funding technology and Internet access in schools and libraries is in decline. The revenue model currently draws 26 cents per month per telephone line in Rhode Island, but exempts cell phones. Revenue continues to decline as more and more households drop landlines in favor of cell phones. The Rhode Island Department of Education has put forward the solution of amending R.I.G.L.§ 39-1-61 to apply the RI-TEAF surcharge equally to cell phones. The recent Connect America Fund will also expand into wireless to secure the revenues available for broadband expansion. To date, no solution has been achieved. An alternative is to increase General Fund appropriations for technology in schools and libraries.

On October 27, 2011 the FCC announced their most significant policy step ever taken to connect all Americans to high-speed Internet, wherever they live, with the creation of the "Connect America Fund" (CAF), which will comprehensively reform its Universal Service Fund and intercarrier compensation systems. Those systems have been widely viewed as broken, and long overdue for reform. CAF will help extend high speed Internet to 18 million un-served Americans and provide a source of sustainable funds to continue programs initiated by the stimulus program grants for broadband. This program addresses not only funding for infrastructure, but also money for broadband in schools and for people who cannot afford today's broadband offerings. Rhode Island needs to be in a position to understand and leverage this new opportunity.

RECOMMENDATIONS

Rhode Island has a window of opportunity to turn its lead in broadband infrastructure into a competitive advantage by accelerating progress toward ubiquitous Internet adoption, educating digital citizens, and deploying e-government applications. These efforts will extend the advantages of living in a broadband connected community to foster economic growth, citizen engagement, quality of life, and life-long learning. To achieve these outcomes requires cross-sector collaboration at the highest levels of government – this is the greatest challenge state government's face in broadband policy. A critical first step is to constitute a high-level broadband innovation policy body to drive changes in the way Rhode Islanders interact with government.

1. Collaborative Leadership through a "Broadband Policy Advisory Board"

Constitute a high-level interagency body with appointed public and private leadership to support collaboration around e-government innovation, broadband adoption, and educating digital citizens.

The board would develop collaborative opportunities with a high return on investment and guide Rhode Island's competitive application for what could be billions of dollars in future nationwide federal funding through the Connect America and other FCC/NTIA programs. The board could receive technical support from the state Office of Information Technology and BBRI. No new state funds would be required.

2. e-Government Innovation

Support agencies in adopting service delivery models that use broadband to improve service while reducing costs. The

top priority in 2012 is supporting the Rhode Island Department of Education's integrated efforts under Race to the Top to build a next generation information system to support education.

Rhode Island will only realize cost savings and improvements in public service delivery from broadband to the extent that state agencies imagine and implement transformative redesigns of mission-critical services. It is critical that the public sector support application development and enable agencies to procure the necessary expertise. By automating routine transactions and the dissemination of information, personnel can spend their time on problem solving and other tasks that humans do better than computers. Actions for state agencies include:

- Help public service providers adopt digital service delivery models that improve services, increase transparency, and support citizen engagement.
- Help public service providers create and implement digital participation plans for their clients.
- Pass along cost savings to citizens that use e-government services.

3. Digital Citizens

Support and publicize digital literacy education across multiple community forums, in order that underserved Rhode Islanders will have the know-how to take advantage of the Internet.

Rhode Islanders need skills in order to make use of the Internet including understanding of security issues for personal information on the Internet. "Digital literacy" is the ability to locate, organize, understand, and analyze information using digital technology. There is a continuum of levels of skill to take greater advantage of the broadband applications to increase productivity, enhance quality of life, and benefit society. Broadband RI is developing a curriculum and mobilizing a volunteer training network through community organizations and libraries. This program will increase constituents' awareness of the resources available to them through the Internet.

4. Support Internet Access for All Rhode Islanders

Budget to sustain Rhode Island's public access points with up-to-date operating systems and fast connection speeds. Update Rhode Island's educational broadband technology funding mechanism by amending the RI-TEAF telephone surcharge to include cell phones. Work to promote and extend programs that provide affordable broadband Internet access and devices.

Every Rhode Islander should have a personal e-mail account and an affordable way to access it. A decade of work by OSHEAN and Ocean State Libraries has created a network of points of free public broadband access. This network is receiving federal funds for 600 new computers/printers and upgrading broadband service. Updating RI-TEAF is the simplest step to enable Rhode Island to maintain public Internet access points with up-to-date operating systems and connection speeds and continue to access federal e-rate matching funds. Otherwise, RI-TEAF, the educational technology funding stream will continue to decline as people switch to cell phones.

5. Adopt a Sustainable Funding Model for Internet -Enabled Public Services

Rhode Island needs a sustainable funding model with diverse funding mechanisms include a modified RI-TEAF surcharge and capital financing for high ROI projects.

The state must spend money on technology to save money. Investments and planning will help position the state to access Connect America and other future FCC/NTIA funding.

Federal Investments in Rhode Island Broadband

The NTIA (National Telecommunications & Information Administration), a division of the U.S. Department of Commerce administered the broadband technology grants, which created substantial support to improve broadband in Rhode Island for 2010-2014.

Expanding Broadband Adoption and Use - Broadband RI

Knowing Rhode Island's Broadband Capacity $1,509,087

With network infrastructure built by a variety of private carriers, it is not a simple task to know how good broadband service is in communities throughout the state. Broadband RI is mapping broadband availability and verifying upload and download speeds.

Establishing Broadband Leadership $2,235,700

Federal funds created the Broadband RI project office, with 3 full time staff through December 2014. This office gives Rhode Island government capacity to act strategically on broadband issues and implement projects to expand broadband adoption.

Using Broadband to Deliver Public Services $450,000

Rhode Island needs to venture into the world of designing models of delivering high value public services via broadband to make government more effective and affordable. This grant is supporting two pilot applications: an Online Business Incubator & Public Safety Notification System.

Expanding Digital Literacy Education $350,000

Broadband Rhode Island's Digital Literacy project is developing and implementing a statewide digital literacy curriculum, creating a network to deliver programs through public libraries and community development organizations, and training the trainers.

Public Computer Centers - Ocean State Libraries $1.245 million awarded February 2010

This grant awarded to OSHEAN will provide over 600 computers/printers and 10 mobile computer centers to Ocean State Libraries- and organization of nearly all the public libraries in Rhode Island.

Community Infrastructure - OSHEAN $21.7 million awarded September 2010

Together with $10.7 million in private investment, the project will complete a 339-mile fiber optic network in 5 counties in Rhode Island and Bristol County, Massachusetts. It will connect over 50 community anchor institutions with a dedicated optical network. The result will be greater broadband capacity for schools, hospital, libraries, and government agencies at lower costs.

Beacon 2.0 project participants are the City of Providence, Narragansett Indian Tribe, Rhode Island State Department of Administration, Rhode Island State Division of Information Technology, Rhode Island Network for Educational Technology (RINET), Municipal Lighting Plant, Care New England, CharterCARE, Lifespan, Providence Community Health Centers, South County Hospital, Westerly Hospital, Brown University, Community College of Rhode Island, New England Institute of Technology, Roger Williams University, Salve Regina University, United States Naval War College, University of Massachusetts Dartmouth, and the University of Rhode Island.

Sustained Funding for Schools and Libraries

The national USAC (Universal Service Administration Company) provides dollar for dollar matching funds to the RI-TEAF (RI Telecommunication Education Access Fund) dollars from a 26 cent surcharge per month from Rhode Island land line telephone customers. These funds assist schools and libraries in purchasing telecommunication technologies and Internet access.

REFERENCES

Akamai. 2011. "State of the Internet, First Quarter 2011 Report." Vol. 4. No. 1.

Atkinson, Rob. November 2009. "Policies to Increase Broadband Adoption at Home." Information Technology and Innovation Foundation.

Berkman Center for Internet and Society at Harvard University. October 2009. "Next Generation Connectivity: A review of broadband Internet transitions and policy from around the world."

Blandin Foundation. October 2010. "Digital Crossroads: Community Guide to State and National Broadband Policy."

Center for Digital Government, 2011. The Digital State Survey.

Churchill, Daniel. "Digital Literacy in a Web 2.0 World (New Literacy)." Slide Presentation.

Crandall, Robert, Robert Litan, and William Lehr. 2007. The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data." The Brookings Institution. Issues in Economic Policy. Number 6.

Federal Communications Commission. "National Broadband Plan: Connecting America." broadband.gov

Federal Communications Commission. Connect America Fund Order and Proposed Rulemaking

Gomez, Anna M. Deputy Assistant Secretary for Communications and Information and Deputy Administrator, National Telecommunications and Information Administration. August 26, 2011. "Digital Literacy is Part of Job Preparedness." Article on NTIA website. www.ntia.doc.gov/blog/2011/digital-literacy-part-job-preparedness

Ilacqua, Joseph A, and A. Ray Thomas. June 2011. "Living, Working and Thriving in a Digital World. The Economic Impact of Broadband." Chafee Center for International Business at Bryant University. Broadband Rhode Island.

Information Technology & Innovation Foundation and Kauffman Foundation of Entrepreneurship. "The 2010 State New Economic Index."

Khanna, Gopal K, Office of Enterprise Technology. 2008. "IT funding strategies for the 21st Century: Building a comprehensive array of investment tools. A report to the Minnesota Legislature."

Kolko, Jed. January 2010. "Does Broadband Boost Local Economic Development?" Public Policy Institute of California.

Litan, Robert. 2005. "Great Expectations: Potential Economic Benefits to the Nation from Accelerated Broadband Deployment to Older Americans and Americans with Disabilities." New Millennium Research Council.

National Association of State Chief Information Officers (NASCIO). 2008. "Innovative Funding for State IT: Models, Trends & Perspectives."

New Commons. 2011. "Rhode Island Broadband Public Policy Report." Draft August 10, 2011. Prepared for BBRI.

One Community. http://onecommunity.org. A resource website created by a non-profit community high-speed fiber network provider in Ohio.

Tech America, NASCIO, and Grant Thorton. 2010. "The 2010 State CIO Survey. Perspectives and trends from state government IT leaders."

U.S. Department of Commerce, National Telecommunications and Information Administration. February 2011. "Digital Nation: Expanding Internet Usage."

William, Tim. 2011. "Connecting Communities. The impact of broadband on communities in the UK and its implications for Australia." A White Paper. HUAWEI.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